

GENES REQUIRED FOR TYPE IV PILI FORMATION AND TWITCHING MOTILITY IN *XYLELLA FASTIDIOSA*

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ABSTRACT

Xylella fastidiosa (*Xf*) (Temecula isolate), an important phytopathogen causing Pierce's disease (PD) of grapevine, was recently shown to possess both type I and type IV pili. It was also shown that the bacteria exhibit type IV pili-mediated twitching motility on modified PW agar, and possess the ability to migrate preferentially against a flowing current. The EZ::TN transposome system was used to develop twitching-defective mutants. Cloning and sequencing analysis revealed seven associated genes residing in three *pil* gene clusters, including the *pilX* cluster (*fimT* and *pilX* and *pilYI*), *pilQ* cluster (*pilQ* and *pilO*) and *pilA* cluster (*pilB* and *pilR*). The *fimT*, *pilX*, *pilQ*, *pilO*, *pilB* and *pilR* mutants lack the twitching phenotype, while the *pilYI* mutant colony exhibited significantly reduced twitching. Transmission electron microscopy revealed that no type IV pili were present on the non-twitching mutants, although type I pili were present. Both types of pili are present at one pole of wild type cells. The results suggest that the *pil* genes disrupted in this study are required for type IV pili formation and twitching motility in *Xf*.

Section 4: Pathogen and Disease Management



